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ABSTRACT

This digest examines research on indicators of teacher quality. While research on the value of a teacher's advanced degree is mixed, all studies suggest that teachers with degrees in subjects different from the subjects they teach have little impact on students. There is no strong consensus about the value of pedagogical preparation for teachers, but findings suggest that teachers with advanced degrees in specific subjects can have an impact on student learning in those subjects in certain settings. There is not a strong enough research base from which to draw definitive conclusions about the value of state regulation of the teacher labor market. Findings vary widely regarding the relationship between years of teaching experience and student outcomes. However, it appears that the magnitude of the experience effect, should it exist, is not terribly large. Some studies indicate that teachers who attend more selective undergraduate colleges are more effective in the classroom. The literature on teachers' academic proficiency indicates that measures of teacher academic proficiency represent one of the best predictors of teacher quality. (Contains 16 references.) (SM)

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INDICATORS OF TEACHER QUALITY

The No Child Left Behind (NCLB) Act requires that states employ only "highly qualified" teachers by the end of the 2005-2006 school year, and, indeed, research has demonstrated teacher quality is the most important educational factor predicting student achievement (Ferguson, 1998; Hanushek, Kain, & Rivkin, 1999). Although studies have produced contradictory findings about which attributes of teachers are most likely to translate into effective classroom performance, some information on how specific teacher attributes correlate with teacher quality is available, and it can help guide administrators' hiring decisions. This digest briefly reviews this knowledge.

Teacher Degree Levels

The research on the value of a teacher's advanced degree is mixed: some studies show that while additional teacher education has a positive correlation with student achievement in some cases, others find that it negatively affects achievement (Greenwald, Hedges, & Laine, 1996; Hanushek, 1986). Goldhaber and Brewer (1997) found that a teacher's advanced degree is not generally associated with increased student learning from the eighth to the tenth grade, but having an advanced degree in math and science for math and science teachers appears to influence students' achievement. The same results were not found to be true for teachers of English or history.

Goldhaber and Brewer (1997) suggest that the findings of other studies about the impact on student achievement of teachers' advanced degrees are inconclusive because they considered only the *level* of the degree and not the *subject* of the degree, which may affect student achievement in different ways than the degree level. Nevertheless, results from all the studies seem to imply that *there is not a positive correlation between teachers having advanced degrees in subjects other than those they teach and student achievement.*

Teacher Preparation: Pedagogical versus Content Knowledge

Here, too, there is no strong consensus about the value of pedagogical preparation for teachers, the teaching of how to teach. In addition, because the quality and content of teacher training programs vary greatly, the impact is not always clear (Wilson, Floden, & Ferrini-Mundy, 2001). Some teacher education courses focus on content specific teaching methods (for certain school or student types), while others teach subject specific teaching methods. Few studies directly link how the type of education courses taken by teachers affects student achievement. Discussions about pedagogical preparation focus instead on secondary measures like the relationship between student achievement and teachers' scores on standardized tests measuring pedagogical knowledge, and the relationship between student achievement and teacher certification status, considered an indication that the teacher completed some kind of pedagogical training.

Because content knowledge is also not clearly defined or measurable in all content areas, studies often rely on an individual's undergraduate coursework as proxies for content preparation. Coursework, however, varies across institutions as does an individual's mastery of content. Whereas Goldhaber and Brewer (1997) found that students who had teachers with subject-related advanced degrees in math and science performed better than students of teachers without subject training, Monk and King-Rice (1994) found that even in subjects where subject-specific training may make a difference (e.g., math), its impact depends on the context of the classes taught: the number of college math courses taken by teachers had an impact on high school students' math achievement, but additional teacher coursework beyond that only mattered if the teacher was teaching an advanced course.

Given that additional studies had similar findings, it can be concluded that *teachers with advanced degrees in specific subjects can have an impact on student learning in those subjects in certain settings. There is too little research available to conclude whether non-subject-specific degrees are correlated with student outcomes.*

Teacher Licensure

Traditionally, state teacher licensure has helped ensure at least a minimal standard of teaching competence. Licensing typically requires that prospective teachers complete a standard set of college level courses in pedagogy or in the subject they wish to teach, and that they pass one or more standardized tests. Because of a tighter teacher labor market, many states now permit schools to employ non-traditionally-licensed teachers. Some believe that such teachers are not prepared to teach, while others feel that alternative licensing may attract better candidates to teaching.

A recent study (Goldhaber & Brewer, 2000) comparing achievement levels of high school students taught by teachers with different types of licensure found that students taught by fully-licensed teachers tended to have higher *levels* of performance in math and science on average. When measuring achievement *growth*, though, there were few differences in achievement between students with teachers who held standard state certification and those with emergency certification in subjects. Their findings illustrate the importance of measuring student achievement gains instead of levels.

A review of about 150 studies on teacher certification by the Abell Foundation (Walsh, 2001) concluded that they did not show that certified teachers are more effective than uncertified teachers, touching off a heated debate about both the Foundation's findings and the quality of the studies reviewed (see, for example, the rejoinder by Darling-Hammond, 2001). Additional studies have also found that students of alternatively certified teachers do at least as well as students whose teachers are fully state-certified (e.g., Miller, McKenna, & McKenna, 1996), while others found that that fully licensed teachers are more effective (e.g., Hawk, Coble, & Swanson, 1985).

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Thus, we believe that *there is not a strong enough research base from which to draw definitive conclusions about the value of state regulation of the teacher labor market.*

Teacher Years of Experience

There is a wide range of findings on the relationship between years of teaching experience and student outcomes. Hanushek (1986) found that fewer than half of the 109 previous studies on the estimated effects of teacher experience showed that experience had any statistically significant effect on student achievement; of those, 33 studies found that additional years of experience had a significant positive effect, but seven found that more experience actually had a negative impact on student achievement. Other studies show a stronger positive relationship between teacher experience and student outcomes in some, but not all, cases they reviewed (e.g., Greenwald et al., 1996). Murnane (1995) suggests that the typical teaching learning curve peaks in a teacher's first few years (estimated at year two for reading and year three for math).

It is also plausible that a positive finding on experience actually results from the tendency of more senior teachers to select higher-level classes with higher achieving students (Hanushek, 1986). Thus we might reasonably infer that *the magnitude of the experience effect, should it exist, is not terribly large.*

Teachers' Academic Proficiency

Researchers have also considered the relationship between student outcomes and teachers' general academic proficiency. Measures such as performance on tests of verbal ability, teacher licensure, or college entrance exams, and the selectivity of the undergraduate institutions attended by teachers, are used as reflections of intelligence and motivation. The research predicting student achievement that includes measures of teacher academic proficiency is not plentiful, but it consistently shows a positive relationship between the two (e.g., Strauss & Vogt, 2001). However, the studies were all conducted at the school or school district level, as opposed to teacher or student level, casting some doubt on them. Measurement issues and issues of causality leave unanswered the question of whether higher-scoring teachers lead to higher-scoring students or whether affluent districts, which tend to have higher achieving students, hire teachers with higher scores.

A few studies conducted at the individual student level found that teachers who attended more selective undergraduate colleges are more effective (Ehrenberg & Brewer, 1994; Summers & Wolfe, 1975). Greenwald et al. (1996) found a total of only nine studies that analyzed the effects of teacher academic proficiency on student achievement, but positive relationships between teachers' academic proficiency and student achievement were found in the overwhelming majority of them. Thus, taken as a whole, the above literature suggests that *measures of teacher academic proficiency represent one of the best predictors of teacher quality.*

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This Digest summarizes a portion of an ERIC Clearinghouse on Urban Education monograph, *Teacher Quality and Student Achievement.* Paper copies are available from the Clearinghouse for $5.00 each. It is also available for no charge in full text on the Clearinghouse's web site.

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